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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,061	02/13/2004	Youji Kawahara	Q78664	5635
23373	7590	10/19/2005	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			MCKINNON, TERRELL L	
			ART UNIT	PAPER NUMBER
			3753	

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/777,061	KAWAHARA ET AL.
	Examiner Terrell L. McKinnon	Art Unit 3743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 26 July 2005.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-5 and 7-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-5 and 7-18 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 13 February 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | Paper No(s)/Mail Date. _____.   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____.                                   |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 7-13 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marcus et al. (U.S. 4,046,190) in view of Eastman (U.S. 4,274,479).

Marcus discloses a plate type heat pipe comprising;

- a condensable, liquid phase working fluid encapsulated in a container sealed in an air-tight condition and a wick provided in the container composed of a porous body;
- a part of the container functioning as the evaporating part;
- another part of the container functions as a condensing part;
- the container is constructed to have a flat thin-shaped section comprising a top face and a bottom face;
- a direct reflux flow passage has a flow cross-sectional area greater than that of a cavity formed in a wick;
- the direct reflux flow passage is formed from the condensing part to

the evaporating part in the container and wherein the direct reflux flow passage is formed between the porous body and an inner face of the container where the porous body is mounted;

- the direct reflux flow passage includes a plurality of flow paths extending from the evaporating part to a plurality of portions on the side of the condensing part;
- wherein a cross- sectional shape of the direct reflux flow passage is selected from the group consisting of a triangular shape, a circular shape, a trapezoidal shape, a semicircular shape, and a square shape; and
- the inputted heat from outside to the evaporating part is 25 to 45 Watts.

Marcus's invention discloses all of the claimed limitations from above except for the porous body is a sheet arranged on the bottom face of the container; the direct reflux flow passage includes a thin slit or thin slits formed on the surface of the porous body; a clearance between the thin slits in the width direction of the porous body changes flexibly in accordance with the width of the porous body; the direct reflux flow passage comprises a concave slit formed on the surface of the porous body disposed opposite to a concave slit formed on the inner face of the container; and the wick is composed of a porous sintered compact and its material is copper powder or ceramic powder.

3. However, Eastman teaches a porous body is a sheet arranged on the bottom face of the container; the direct reflux flow passage includes a thin slit or thin slits formed on the surface of the porous body; a clearance between the thin slits in the width direction of the porous body changes flexibly in accordance with the width of the porous

body; the direct reflux flow passage comprises a concave slit formed on the surface of the porous body disposed opposite to a concave slit formed on the inner face of the container; and the wick is composed of a porous sintered compact and its material is copper powder or ceramic powder.

Given the teachings of Eastman, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the plate type heat pipe of Marcus with porous body is a sheet arranged on the bottom face of the container; the direct reflux flow passage includes a thin slit or thin slits formed on the surface of the porous body; a clearance between the thin slits in the width direction of the porous body changes flexibly in accordance with the width of the porous body; the direct reflux flow passage comprises a concave slit formed on the surface of the porous body disposed opposite to a concave slit formed on the inner face of the container; and the wick is composed of a porous sintered compact and its material is copper powder or ceramic powder.

Doing so would improve the heat transferring ability of the heat pipe.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marcus et al. (U.S. 4,046,190) in view of Eastman (U.S. 4,274,479) as applied to claims above, and further in view of Del Bagno et al. (U.S. 4,489,777).

Marcus's invention as modified by Eastman, discloses all of the claimed limitations from above except for a clearance between the plurality of flow paths on the evaporating part side is wider than that on the condensing part side in connection with

that the width of the wick is wider on the evaporating part side, in order to arrange the reflux flow passages evenly in the width direction of the wick.

5. However, Del Bagno teaches heat pipes having multiple integral wick structures, wherein a clearance between the plurality of flow paths on the evaporating part side is wider than that on the condensing part side in connection with that the width of the wick is wider on the evaporating part side, in order to arrange the reflux flow passages evenly in the width direction of the wick.

Given the teachings of Del Bagno, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the flat heat pipe of Marcus with a clearance between the plurality of flow paths on the evaporating part side is wider than that on the condensing part side in connection with that the width of the wick is wider on the evaporating part side, in order to arrange the reflux flow passages evenly in the width direction of the wick.

Doing so would provide enhance capillary action to improve heat dissipation.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references cited on the USPTO 892 discloses related limitations of the applicant's claimed and disclosed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrell L. Mckinnon whose telephone number is 571-

272-4797. The examiner can normally be reached on Monday -Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennett can be reached on 571-272-4791. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Terrell L Mckinnon  
Primary Examiner  
Art Unit 3743  
October 17, 2005